

# amsterdreams whitepaper

This document describes the amsterdreams project and its AMS ERC-20 token, from project motivation to token dynamics.



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[amsterdreams.com](https://amsterdreams.com)



## Why amsterdreams

amsterdreams is a lean real estate blockchain startup that aims to solve two problems in the world today.

### Availability of homes with return on investment

One, it is very difficult for many people to own their home nowadays, especially if it's the first home. Many groups of people, even if they have the money to pay for monthly mortgage payments, cannot get that mortgage. Banks are very conservative and have a long (and expanding, less and less intuitive) list of criteria. Typical exclusion criteria include entrepreneurs without a long history of profitability, expats and people with a previous mortgage that persisted after a divorce.

Renting is an available option, but it's not without its challenges. Rising interest rates drives more people into the rental market. Demand increases at more or less constant, low supply. Not only do prices go up, but the number of people competing for the same home is high. Also, there are some strange phenomena in the private sector: next to their financial offer, potential renters are often also asked to submit a bio. Discrimination is never mentioned explicitly, but isn't selecting people based on their bio exactly that...?

Finally, the biggest problem for many is that there is no return on the rent that is paid every month. It is just gone.

### Making real estate investment available to small investors

Two, offer the possibility to invest in real estate without being a real estate mogul. Irrespective of where you live in the world or whether you rent or buy, it's been challenging these days to decide where to invest any savings you may have. Obvious choices include a savings account, the stock market and cryptocurrency.

Neither of these three choices are ideal. Savings accounts had close to 0% interest for years, so no growth. Cryptocurrency can be very lucrative, but since most altcoins are purely supply-and-demand driven, they are also very volatile. You need to invest time and energy into understanding what you invest in and actively manage your portfolio. The stock market is a little bit the same: if you know what you're doing and you keep track of companies, their successes and their problems, their competitor moves, market trends, and so on – then you can be very successful. But if you just put money there and wait, you may face short-term losses. Cryptocurrency and the stock market have in common that the most successful strategies tend to be long-term ones.

Real estate has the reputation of being stable and growing over the long term, but the sheer amounts of money involved make it inaccessible to most people.

### Real estate tokenization

amsterdreams combines the two problems into one solution: providing small investors the opportunity to invest in real estate and then make the homes their money buys available for rent-to-own.

The renters – amsterdreams calls them customers – pay their rent in tokens each month. These are the same tokens bought by the investors. Every customer is therefore an investor. When a customer has collected sufficient tokens, the home ownership is transferred to this customer.



## Why Amsterdam?

Amsterdam, the capital of Netherlands, was chosen for two reasons. Personally and emotionally, it is home to the founders. It is a vibrant, international, business and culture hub with a major international airport where English is spoken almost everywhere. It is home to people from all over the world: according to Google search results, people from over 170 nationalities call Amsterdam home and more than half the population of the city is not originally Dutch. Amsterdam is known for its diversity and tolerance to all walks of life, religion and sexual orientation.

Economically speaking, these nice properties cause a high demand for housing. At the same time, supply of housing is limited: the housing in highest demand is wrapped within Amsterdam's A10 Ring motorway and cannot expand. This has historically caused very strong and robust growth, making Amsterdam real estate a good asset to invest in.

## The AMS token

The AMS token is an ERC-20 token on the Ethereum blockchain. Its function is to represent a fraction of a piece of real estate.

## Initial supply

The initial supply of AMS is set at 100,000 tokens. The initial value of 1 AMS is 1,000 Euro. The initial supply therefore represents a value of 100 million Euro, which at an average value of 500,000 euro for a home in 2022 is about 200 properties. This is considered a viable size for amsterdreams to continue to exist long-term.

The initial supply is locked up in three ways:

1. The majority, close to 60%, is kept in offline, hardware, multisig wallets until it is needed for either of the following two.
2. Uniswap liquidity pools, against Ether (ETH) and the USDT and EURS stablecoins.
3. A small portion, about 5%, is in a wallet connected to the amsterdreams website token selling functionality. Its keys are protected as Docker secrets that run on a dedicated, hardened server hosted in a datacenter.

## Minting and burning

Minting and burning facilities are available, also using offline, hardware, multisig wallets. Minting will be needed if the portfolio size increases beyond 100,000 AMS, so as not to limit the growth of the business. Burning will be used if, after some form of recession that limited the size of the portfolio, the number of minted tokens exceeds the value of the acquired real estate by 100,000 AMS or more.

## Smart contract

The AMS smart contract is derived from the OpenZeppelin ERC20MinterPauser. Its full source code is at the end of this whitepaper. The contract has been deployed to the blockchain at address `0x571b265d8f61cd71e6ce54569dae6adbb1c5ebb9` and its byte code has been verified on etherscan.io.



## Oracle

The AMS contract exposes the Rate, i.e. the value of 1 AMS in Euro. This property is set manually, manually as in by a human, based on the actual value of the real estate portfolio in Euro divided by the number of AMS tokens it is composed of. This rate setting happens after each significant portfolio change:

- Acquisition of new property
- Selling of property
- Transfer of property to customer after they have acquired sufficient tokens
- Availability of public price data from the housing market
- Valuation of one or more properties by a professional agent

The rate serves as an on-chain oracle for the value of AMS in Euro.

## Governance and financing

### Legal structure

amsterdreams is incorporated as a B.V., a Besloten Vennootschap, under Dutch law. A B.V. is privately owned and its register of shareholders can be obtained from the Amsterdam Chamber of Commerce. A B.V. has many similarities to the American Limited Liability Company (LLC).

### Business model

amsterdreams B.V. is a for-profit company. Income consists of a service fee that customers pay on top of their investment in tokens. The profit after tax is distributed among shareholders at the discretion of the board of directors, or reinvested in the company. amsterdreams investors, by which is meant the holders of AMS tokens, are not company shareholders. Their benefit is in the rise of value of the AMS token itself, which is backed by the real estate objects in the portfolio.

### Startup capital

amsterdreams is funded by its founding shareholders. This funding is used for operational expenses, like IT, marketing, legal and office facilities. All real estate is purchased from the proceeds of the sale of AMS tokens.

### Investors

There are no other private or institutional investors and amsterdreams is free of bank loans. The amsterdreams investors are the buyers of AMS tokens. Their investment shows up on the amsterdreams balance sheet as debt. The assets on the opposite side are the real estate objects.

### Cash flow management

AMS tokens derive their value from the real estate objects in the portfolio. Real estate objects take time to buy and sell. Also, it is not feasible to sell an entire real estate object if one investor wants to exchange their AMS tokens back to (stable)coins or fiat currency.



For this reason, amsterdreams makes use of a bank account called the Vault: initial proceeds from selling AMS tokens flow into this vault, until enough money has accumulated to buy real estate objects. A reserve of 5-10% of the value of the entire portfolio is kept in the Vault at all times to ensure liquidity for the kind of exchange mentioned above. The size of the reserve is determined by market conditions.

### Token valuation

The AMS token derives its value from the value of the underlying real estate objects in the amsterdreams portfolio. It is roughly comparable to the old gold standard that was used for fiat currency.

Here is an example of how the AMS valuation works. Let's say there are three properties 1,2 and 3 in the amsterdreams portfolio. They are respectively 60, 70 and 80 square meters, situated in neighborhoods A, B and C and their initial value is 300, 400 and 500 AMS on January 1, 2023.

January 1, 2023				1 AMS = 1,000 EUR
Home	Neighborhood	Floor area (m <sup>2</sup> )	Value (AMS)	Value (kEUR)
1	A	60	300	300
2	B	70	400	400
3	C	80	500	500

The total AMS supply in this example is  $300 + 400 + 500 = 1,200$  AMS, representing 1.2 million EUR in real estate. Now assume that on Feb 1, new housing market data becomes available that shows that the prices in neighborhoods A and C have risen by 2%, while in neighborhood B they have decreased by 1%. This means:

February 1, 2023				
Home	Neighborhood	Floor area (m <sup>2</sup> )	Value (AMS)	Value (kEUR)
1	A	60	300	306 (+ 2%)
2	B	70	400	396 (- 1%)
3	C	80	500	510 (+ 2%)

As you can see, the values of the homes are constant in AMS. Once the customer has put in 400 AMS for apartment B, ownership is transferred.

In Euro, however, the portfolio is now worth  $306 + 396 + 510 = 1.212$  million EUR. 1 AMS is now worth  $1,212 / 1,200 = 1,010$  Euro per AMS. The value of AMS is determined by the weighted average of homes in the portfolio.

Average market figures are available periodically and they are robust, as they are based on all the transactions in the market. They are also public and verifiable. Other (re)valuation means include taxation by a certified expert and the direct purchase and sale of homes by amsterdreams.

As a final example, consider amsterdreams buying a second home in neighborhood A, where the Euro value per square meter was  $306 / 60 = 5,100$  Euro per m<sup>2</sup>. On



March 1, 2023, amsterdreams buys another home in that neighborhood of 90 m<sup>2</sup>, for 476 kEUR. At 1,010 EUR per AMS, remember, the value of the home in AMS is then 471.3.

March 1, 2023				
Home	Neighborhood	Floor area (m <sup>2</sup> )	Value (AMS)	Value (kEUR)
1	A	60	300	?
2	B	70	400	396
3	C	80	500	510
4	A	90	471.3	476

This means two things. Home 1 is revalued with the new square-meter price for neighborhood A: 5,289 Euro. Its value then becomes 317.3 kEUR. The total amount of AMS in the market is now 1,671.3 AMS, representing 1.699 million Euro in property value. That means the value of 1 AMS, as will be reflected in the Rent property of the token on the blockchain, is 1,050.07 Euro per AMS.

March 1, 2023				1 AMS = 1,050.07 EUR
Home	Neighborhood	Floor area (m <sup>2</sup> )	Value (AMS)	Value (kEUR)
1	A	60	300	317.3
2	B	70	400	396
3	C	80	500	510
4	A	90	471.3	476



## AMS smart contract source code

```
// SPDX-License-Identifier: MIT
// amsterdreams AMS token 1.0.0

pragma solidity ^0.8.0;

import "@openzeppelin/contracts/token/ERC20/presets/ERC20PresetMinterPauser.sol";

contract AmsToken is ERC20PresetMinterPauser
{
    bytes32 public constant RATE_ROLE = keccak256("RATE_ROLE");

    /*
    * AMS exchange rate, 18 decimals
    * if amsRateInEur == 1e18, then 1 AMS = 1 EUR
    * if amsRateInEur == 1e21, then 1 AMS = 1000 EUR
    */
    uint256 private amsRateInEur;

    constructor (uint256 _initialSupply)
        ERC20PresetMinterPauser("amsterdreams", "AMS")
    {
        if (_initialSupply > 0)
            mint(_msgSender(), _initialSupply);

        amsRateInEur = 1e21; // Standard opening price, 1 AMS = 1000 EUR

        // Setup creator as someone who can set the exchange rate
        _setupRole(RATE_ROLE, _msgSender());
    }

    event AmsRateInEurChanged(uint256 _newRate);

    function getAmsRateInEur() public view returns(uint256)
    {
        return amsRateInEur;
    }

    function setAmsRateInEur(uint256 _newRate) public
    {
        require(hasRole(RATE_ROLE, _msgSender()),
            "AmsToken: must have RATE_ROLE to set exchange rate");
        require(_newRate >= 1000000000000000000, "AMS rate in EUR has to be at least 1");

        amsRateInEur = _newRate;
        emit AmsRateInEurChanged(_newRate);
    }
}
```